

APPENDIX OF PENDING CLAIMS 1-33 AND NEW CLAIMS 34-111

1. A syringe for use with an injector having a movement mechanism operably associated therewith, the syringe comprising:

a body comprising a distal discharge end;

a plunger movably disposed within the body; and

at least one agitation element disposed within the body between the plunger and the distal discharge end, the at least one agitation element operable to agitate a fluid in the syringe when the syringe is moved with respect to gravity by means of the movement mechanism operably associated with the injector.

2. The syringe of Claim 1 wherein the fluid comprises a contrast agent.

3. The syringe of Claim 2 wherein the contrast agent comprises an ultrasound contrast agent.

4. The syringe of Claim 1 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

5. The syringe of Claim 1 wherein the at least one agitation element comprises a solid.

6. The syringe of Claim 5 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

7. The syringe of Claim 1 wherein the at least one agitation element comprises a gas.

8. The syringe of Claim 1 wherein the movement mechanism operably associated with the injector is operable to move the syringe in one or more of circular, partially circular and linear motions.

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9. The syringe of Claim 1 wherein the movement mechanism operably associated with the injector is operable to move the syringe in a rotational motion.

10. The syringe of Claim 9 wherein the axis of rotation is variable.

11. The syringe of Claim 1 wherein the at least one agitation element comprises a casing.

12. The syringe of Claim 7 wherein the at least one agitation element is surrounded by a cover.

13. The syringe of Claim 1, further comprising a recess defined in the body of the syringe, the recess operable to accommodate the at least one agitation element.

14. The syringe of Claim 13 wherein the recess is defined adjacent to the distal discharge end of the syringe.

15. The syringe of Claim 1, further comprising a recess defined in the plunger of the syringe, the recess operable to accommodate the at least one agitation element.

16. The syringe of Claims 13-15 wherein the recess comprises an annular recess.

17. An injector system comprising:  
an injector comprising means for mounting a syringe thereon;  
a syringe comprising a body having a distal discharge end and means cooperable with the injector means for mounting the syringe on the injector, a plunger movably disposed within the body, and at least one agitation element disposed within the body between the plunger and the distal discharge end; and

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a movement mechanism operably associated with the injector, the movement mechanism operable to move the syringe such that the at least one agitation element agitates a fluid contained in the syringe.

18. The injector system of Claim 17 wherein the fluid comprises a contrast agent.

19. The injector system of Claim 18 wherein the contrast agent comprises an ultrasound contrast agent.

20. The injector system of Claim 17 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

21. The injector system of Claim 17 wherein the at least one agitation element comprises a solid.

22. The injector system of Claim 21 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

23. The injector system of Claim 17 wherein the at least one agitation element comprises a gas.

24. The injector system of Claim 17 wherein the movement mechanism moves the syringe in one or more of circular, partially circular and linear motions.

25. The injector system of Claim 17 wherein the movement mechanism moves the syringe in a rotational motion.

26. The injector system of Claim 25 wherein the axis of rotation is variable.

27. The injector system of Claim 23 wherein the at least one agitation element is surrounded by a cover.

28. The injector system of Claim 17, further comprising a recess defined in the body of the syringe, the recess operable to accommodate the at least one agitation element.

29. The injector system of Claim 28 wherein the recess is defined adjacent to the distal discharge end of the syringe.

30. The injector system of Claim 17, further comprising a recess defined in the plunger of the syringe, the recess operable to accommodate the at least one agitation element.

31. The injector system of Claims 28-30 wherein the recess comprises an annular recess.

32. A method for agitating the contents of a syringe, comprising:  
providing an injector comprising means for mounting a syringe thereon;  
providing a syringe comprising a body having a distal discharge end and means cooperable with the injector means for mounting the syringe on the injector, a plunger movably disposed within the body, and at least one agitation element disposed within the body between the plunger and the distal discharge end;

providing a movement mechanism operably associated with the injector, the movement mechanism operable to move the syringe such that the at least one agitation element agitates a fluid contained in the syringe;

activating the movement mechanism to move the syringe; and

agitating the fluid in the syringe with the at least one agitation element.

33. The method of Claim 32, further comprising the step of deactivating the movement mechanism to terminate the agitation of the syringe contents.

34. A syringe for use with an injector having a movement mechanism operably associated therewith, the syringe comprising:

a body comprising a distal discharge end;

a plunger movably disposed within the body; and

at least one agitation element disposed within the body between the plunger and the distal discharge end, the at least one agitation element operable to agitate a fluid in the syringe when the syringe is rotated by means of the movement mechanism.

35. The syringe of Claim 34 wherein the fluid comprises a contrast agent.

36. The syringe of Claim 35 wherein the contrast agent comprises an ultrasound contrast agent.

37. The syringe of Claim 34 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

38. The syringe of Claim 34 wherein the at least one agitation element comprises a solid.

39. The syringe of Claim 38 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

40. The syringe of Claim 34 wherein the at least one agitation element comprises a gas.

41. The syringe of Claim 34 wherein the movement mechanism operably associated with the injector is further operable to move the syringe in one or more of circular, partially circular and linear motions.

42. The syringe of Claim 34 wherein the axis of rotation is variable.

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43. The syringe of Claim 34 wherein the at least one agitation element comprises a casing.

44. The syringe of Claim 40 wherein the at least one agitation element is surrounded by a cover.

45. The syringe of Claim 34, further comprising a recess defined in at least one of the body of the syringe and the plunger of the syringe, the recess operable to accommodate the at least one agitation element.

46. The syringe of Claim 45 wherein the recess is defined in the body of the syringe adjacent to the distal discharge end thereof.

47. The syringe of Claim 45 wherein the recess is defined in the plunger of the syringe.

48. The syringe of Claim 45 wherein the recess comprises an annular recess.

49. A syringe for use with an injector having a movement mechanism operably associated therewith, the syringe comprising:

a body comprising a distal discharge end;

a plunger movably disposed within the body;

at least one agitation element disposed within the body between the plunger and the distal discharge end, the at least one agitation element operable to agitate a fluid in the syringe when the syringe is moved with respect to gravity by means of the movement mechanism; and

a recess defined in the body of the syringe, the recess operable to accommodate the at least one agitation element.

50. The syringe of Claim 49 wherein the fluid comprises a contrast agent.

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51. The syringe of Claim 50 wherein the contrast agent comprises an ultrasound contrast agent.

52. The syringe of Claim 49 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

53. The syringe of Claim 49 wherein the at least one agitation element comprises a solid.

54. The syringe of Claim 53 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

55. The syringe of Claim 49 wherein the at least one agitation element comprises a gas.

56. The syringe of Claim 49 wherein the movement mechanism operably associated with the injector is operable to move the syringe in one or more of circular, partially circular and linear motions.

57. The syringe of Claim 49 wherein the movement mechanism operably associated with the injector is operable to move the syringe in a rotational motion.

58. The syringe of Claim 57 wherein the axis of rotation is variable.

59. The syringe of Claim 49 wherein the at least one agitation element comprises a casing.

60. The syringe of Claim 55 wherein the at least one agitation element is surrounded by a cover.

61. The syringe of Claim 49 wherein the recess comprises an annular recess.

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62. An injector system comprising:

an injector comprising a syringe mounting device;

a syringe comprising:

a body comprising a distal discharge end and an injector attachment device cooperable with the syringe mounting device for mounting the syringe on the injector;

a plunger movably disposed within the body; and

at least one agitation element disposed within the body between the plunger and the distal discharge end; and

a movement mechanism operably associated with the injector, the movement mechanism operable to move the syringe such that the at least one agitation element agitates a fluid contained in the syringe.

63. The injector system of Claim 62 wherein the fluid comprises a contrast agent.

64. The injector system of Claim 63 wherein the contrast agent comprises an ultrasound contrast agent.

65. The injector system of Claim 62 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

66. The injector system of Claim 62 wherein the at least one agitation element comprises a solid.

67. The injector system of Claim 66 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

68. The injector system of Claim 62 wherein the at least one agitation element comprises a gas.

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69. The injector system of Claim 62 wherein the movement mechanism moves the syringe in one or more of circular, partially circular and linear motions.

70. The injector system of Claim 62 wherein the movement mechanism moves the syringe in a rotational motion.

71. The injector system of Claim 70 wherein the axis of rotation is variable.

72. The injector system of Claim 68 wherein the at least one agitation element is surrounded by a cover.

73. The injector system of Claim 62, further comprising a recess defined in at least one of the body of the syringe and the plunger of the syringe, the recess operable to accommodate the at least one agitation element.

74. The injector system of Claim 73 wherein the recess is defined in the body of the syringe adjacent to the distal discharge end thereof.

75. The injector system of Claim 73 wherein the recess is defined in the plunger of the syringe

76. The injector system of Claim 73 wherein the recess comprises an annular recess.

77. An injector system comprising:

an injector comprising a syringe mounting device;

a syringe comprising:

a body comprising a distal discharge end and an injector attachment device cooperable with the syringe mounting device for mounting the syringe on the injector;

a plunger movably disposed within the body; and

at least one agitation element disposed within the body between the plunger and the distal discharge end; and

a movement mechanism operably associated with the injector, the movement mechanism operable to rotate the syringe such that the at least one agitation element agitates a fluid contained in the syringe.

78. The injector system of Claim 77 wherein the fluid comprises a contrast agent.

79. The injector system of Claim 78 wherein the contrast agent comprises an ultrasound contrast agent.

80. The injector system of Claim 77 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

81. The injector system of Claim 77 wherein the at least one agitation element comprises a solid.

82. The injector system of Claim 81 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

83. The injector system of Claim 77 wherein the at least one agitation element comprises a gas.

84. The injector system of Claim 77 wherein the movement mechanism is further operable to move the syringe in one or more of circular, partially circular and linear motions.

85. The injector system of Claim 77 wherein the axis of rotation is variable.

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86. The injector system of Claim 83 wherein the at least one agitation element is surrounded by a cover.

87. The injector system of Claim 77, further comprising a recess defined in at least one of the body of the syringe and the plunger of the syringe, the recess operable to accommodate the at least one agitation element.

88. The injector system of Claim 87 wherein the recess is defined in the body of the syringe adjacent to the distal discharge end thereof.

89. The injector system of Claim 87 wherein the recess is defined in the plunger of the syringe

90. The injector system of Claim 87 wherein the recess comprises an annular recess.

91. An injector system comprising:

an injector comprising a syringe mounting device;

a syringe comprising:

a body comprising a distal discharge end, an injector attachment device cooperable with the syringe mounting device for mounting the syringe on the injector, and a recess defined therein;

a plunger movably disposed within the body; and

at least one agitation element disposed within the body between the plunger and the distal discharge end, the recess operable to accommodate the at least one agitation element; and

a movement mechanism operably associated with the injector, the movement mechanism operable to move the syringe such that the at least one agitation element agitates a fluid contained in the syringe.

92. The injector system of Claim 91 wherein the fluid comprises a contrast agent.

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93. The injector system of Claim 92 wherein the contrast agent comprises an ultrasound contrast agent.

94. The injector system of Claim 91 wherein the at least one agitation element has a density different from that of the fluid contained within the syringe.

95. The injector system of Claim 91 wherein the at least one agitation element comprises a solid.

96. The injector system of Claim 95 wherein the at least one agitation element has a density greater than that of the fluid in the syringe.

97. The injector system of Claim 91 wherein the at least one agitation element comprises a gas.

98. The injector system of Claim 91 wherein the movement mechanism moves the syringe in one or more of circular, partially circular and linear motions.

99. The injector system of Claim 91 wherein the movement mechanism moves the syringe in a rotational motion.

100. The injector system of Claim 99 wherein the axis of rotation is variable.

101. The injector system of Claim 97 wherein the at least one agitation element is surrounded by a cover.

102. The injector system of Claim 91 wherein the recess is located adjacent to the distal discharge end of the syringe.

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103. The injector system of Claim 91 wherein the recess comprises an annular recess.

104. A method for agitating the contents of a syringe comprising a body having a distal discharge end, a plunger movably disposed within the body and at least one agitation element disposed within the body between the plunger and the distal discharge end, the method comprising:

providing a movement mechanism operably associated with an injector to which the syringe is mounted, the movement mechanism operable to move the syringe such that the at least one agitation element agitates a fluid contained in the syringe;

activating the movement mechanism to move the syringe; and

agitating the fluid in the syringe with the at least one agitation element.

105. The method of Claim 104, further comprising:

deactivating the movement mechanism to terminate the agitation of the syringe contents.

106. The method of Claim 104 wherein the contents of the syringe comprise a contrast agent.

107. The method of Claim 104 wherein the movement mechanism rotates the syringe.

108. The method of Claim 107 wherein the axis of rotation is variable.

109. The method of Claim 104 wherein the syringe further comprises a recess defined in at least one of the body of the syringe and the plunger of the syringe, the recess operable to accommodate the at least one agitation element.

110. The method of Claim 109 wherein the recess is defined in the body of the syringe adjacent to the distal discharge end thereof.

111. The method of Claim 109 wherein the recess comprises an annular recess.

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